

KARTSEV, Ye.B., inzh.; VOYNOV, Ye.S., inzh.; BRAYNIN, V.N., tekhnik

Mechanized departments of welding and flame machining of metals.
[Trudy]LMZ no.11:83-98 '64. (MIRA 17:12)

RABOTNOV, B.A., inzh.; BRAYNIN, V.N., tekhnik

Semiautomatic welding in carbon dioxide. [Trudy]LMZ no.11:99-108 '64.
(MIRA 17:12)

RAZUMAYEVA, V.I. [translator]; BRAYNIN, Ye.I. [translator]; YANISHEVSKIY,
V.M., inzh., red.; SOKOL'SKIY, I.P., red. izd-va; GOL'BERG, T.M.,
tekhm.red.

[Glass in construction] Steklo v stroitel'stve; sbornik statei.
Pod red. V.M. Ianishevskogo. Moskva, Gos. izd-vo lit-ry po stroit.,
arkhit. i stroit. materialam, 1961. 175 p. Translated from the
Czech. (MIRA 14:6)

(Glass construction)

BRAYNIN, Z.S., prepodavatel'

Periarteritis nodosa as one of the variants of collagen disease.
Zdrav. Belor. 5 no.9:66-68 S '59. (MIRA 12:12)

1. Mogilevskoye meditsinskoye uchilishche.
(ARTERIES--DISEASES) (COLLAGEN DISEASES)

BRAYNIN, Z.S.

Results of the commemorative session dedicated to the 100th
anniversary of the Mogilev Scientific Society of Physicians.
Zdrav. Bel. 9 no.6:83-85 Ja 163. (MIRA 1985)

BRAYNINA, A.L.

Successful therapy of a case of Still-Felty's disease by splenectomy
[with summary in English, p.63]. Probl.gemat. i perel.krovi 4 no.2:
55-56 F '59. (MIRA 12:2)

1. Iz terapevticheskogo otdeleniya (zav. M.P. Redlikh) Vladimirs-
skoy oblastnoy bol'nitsy (glavnyy vrach N.S. Aleyeva).

(SPLEEN, surgery,

excis. in Still Felty's synd. (Rus))

(ARTHRITIS, RHEUMATOID, surgery,

splenectomy in Still-Felty's synd. (Rus))

BRAYNINA, A. Z.

1/ The stationary potential, the exchange current, and the charging current of a dropping amalgam electrode. A. G. Stromberg and A. Z. Braynina (A. M. Gor'kii Ural State Univ.). *Doklady Akad. Nauk S.S.S.R.* 97, 863-6 (1954); cf. *C.A.* 49, 631; 49, 11463s. — The shift φ_s of the stationary potential (I) is related to i_0 , the exchange current, and to i_c , the charging current, by $i_c/i_0 = [(I_0 - i_c)/I_0] e^{-\alpha n F \varphi_s / RT} - [(I_0 + i_c)/I_0] e^{-\beta n F \varphi_s / RT}$, where I_0 and I_c are the cathode and anode limiting currents, resp., α and β are the coeffs. of the retarded discharge-ionization theory, such that $\alpha + \beta = 1$, and $b' = 0.0257 s$, where s is the metal-ion charge. If the limiting currents exceed the charging current, and the shift of I exceeds $0.05/\alpha z$ or $0.05/\beta z$, then the above equation is simplified to $\varphi_s = (b/a) \log (i_c/i_0)$. On cathodic polarization, when I tends to be more pos. than the zero charge potential, φ_s and i_c are considered pos. If I is less pos. than the zero charge potential φ_s , φ_s , and i_c are neg. The shift of I in the case of Cu is to the neg. side, while with Sn, Cd, and Zn the shift is to the pos. side. Here, I is, resp., more pos. and more neg. than the zero charge potential. With Bi the shift is absent. Increasing the ion and atom concn. of Sn ten times decreases the shift of I because of the increase in the exchange current. The shift of I increases in the series Sn-Cd-Zn with increasing neg. value of equil. potential. Here, the exchange current is almost the same, but the charging current at I increases in the series as I diverges from zero charge potential. The decrease in the shift of I of Cd amalgam with decreased camphor concn., established by Stromberg (*loc. cit.*) previously, is explained by the increased ex-

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A. G. *St...*
change current. Similarly, the increased shift of I_{on} increasing the rate of dropping of the amalgam is explained by the increased rate of formation of fresh amalgam surface and, hence, of the increased charging current. Besides confirming the retarded discharge-ionization theory, the above work indicates the applicability of this theory to elucidating the mechanism of action of surface-active substances, in accord with the views of Frumkin (C.A. 40, 10856f).
B. M. Elkin

ZHELUBOVSKAYA, K.V.; BRAYNINA, B.I.

Separation method for the removal of microfauna from Quaternary rocks using heavy medium PD-3. Paleont. zhur. no. 4: 101-103 '64. (MIRA 18:3)

1. Pyatoye geologicheskoye upravleniye Gosudarstvennogo geologicheskogo komiteta SSSR.

RUDASHEVSKIY, S.Ye.; BRAYNINA, E.G.; GUSEL'NIKOVA, K.G.; STEPUSHKINA, T.A.

Physiological rest and stimulation of spinal centers. Vest.LGU 15
no.21:137-149 '60. (MIRA 14:4)
(Spinal cord) (Electrophysiology)

BRAYNINA, B. Ya

Konstantin Fedin. Moskva, Izd vo "Znaniye", 1954.
29 p.

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81701

S/020/60/132/05/28/069
B011/B126

5.4110

AUTHORS: Zhuravleva, M. G., Chufarov, G. I., Corresponding Member
AS USSR, Braynina, D. Z.

TITLE: Reduction of Manganese Ferrite⁸ by Hydrogen and Graphite¹⁵

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 5,
pp. 1074 - 1077

TEXT: The authors carried out the above reduction by hydrogen in a closed apparatus with gas circulation. The reduction rate of ferrite rises as the reduction progresses and reaches a maximum at about 30-40% oxygen removal (Fig. 1). The reduction then slows down and comes practically to a halt after removal of 75% O₂. According to X-ray-structural analysis the sample contained metallic iron and manganous oxide. The use of graphite powder in a vacuum of about 10⁻² mm caused the reduction rate to decrease with progressing process (Fig. 2). The kinetic curve shows a clear minimum at about 25% reduction. The reduction then accelerates a little, only to sink to nil towards the end of the process.

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Reduction of Manganese Ferrite by Hydrogen and Graphite

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Graphite completely reduces manganoferrite at $1,000^{\circ}$. The Spinell phase can only be proved for up to 20% reduction. Possible phases here are ferrous oxide, manganous oxide, or their solid solutions. No metallic phase is detectable in this study. Above a 20% reduction there are two phases, the lower oxide and the metal phases. There are solid solutions of stable concentration here. According to the phase diagram of the Mn-Fe system (Ref. 6), the solid γ -solution is stable at $1,000^{\circ}$. X-ray pictures show a predominant quantity of the solid α -solution, which is formed by cooling the γ -solution. Admixtures of potassium- or sodium carbonates accelerate the reduction of manganoferrite (Fig. 2). A phase with a Spinell-like lattice, similar to that of the ferrite used, is present in an 18.93% reduced sample, but it cannot be proved at 28.9% reduction. A phase with an NaCl-like lattice (which corresponds to the sub-oxide phase of MnO), is present in all samples. Its lattice parameter increases with the percentage of the reduction and approaches the size of the MnO-lattice, without, however, reaching it (Fig. 3). On the basis of these data the authors give a reduction mechanism of manganese-ferrite: when the oxygen is removed, a surplus of metal ions is formed on the surface of the crystal lattice. They can either form a ferrite

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81701

Reduction of Manganese Ferrite by Hydrogen and Graphite S/020/60/132/05/28/069
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lattice or a metal phase. Which process predominates depends on the ratio of oxygen removal rate to the reaction diffusion. When hydrogen is used for the reduction, the oxygen removal rate is higher than that of the diffusion. When graphite is used for the reduction, both rates are commensurable. The admixtures of alkali metal salts accelerate the chemical interaction of both the reducing compound and of that which is to be reduced. This is related to the variation in the electron condition of the lattice, into which univalent ions penetrate (Ref. 9). There are 3 figures and 9 references: 4 Soviet, 4 American, and 1 German.

ASSOCIATION: Institut metallurgii Ural'skogo filiala Akademii nauk SSSR
(Institute of Metallurgy of the Ural Branch of the Academy
of Sciences, USSR)

SUBMITTED: March 14, 1960

Card 3/3

S/076/62/036/011/008/021
B101/B180

AUTHORS: Averbukh, B. D., ~~Braynina, D. Z.~~, Antonov, V. K., and
Chufarov, G. I. (Sverdlovsk)

TITLE: Study of equilibrium conditions in the reduction of manganese
ferrite by hydrogen

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 11, 1962, 2436 - 2441

TEXT: To find out the structure of ferrites and suitable conditions for
their production, the reduction of manganese ferrite in hydrogen was
studied at 900°C. Manganese ferrites of different compositions were
produced by sintering Fe_2O_3 - MnO mixtures at 1200°C in various atmospheres
(CO_2 , Ar, $\text{CO}_2 + \text{O}_2$, or air), and by sintering Fe_2O_3 - MnO - Mn_3O_4 mixtures.
Debye patterns showed that the resulting ferrites were single-phase. The
reduction was performed in a mixture of water vapor ($p_{\text{H}_2\text{O}} = 4.579$ mm Hg) and
hydrogen ($p_{\text{H}_2} = 10^{-3} - 10^2$ mm Hg). After equilibrium had been established

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Study of equilibrium conditions in...

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between ferrite and gas mixture, the water was frozen out, the p_{H_2} measured, the degree of reduction determined from the H_2 consumption, and p_{O_2} the equilibrium pressure calculated. The phases formed in the reduced ferrite were identified by Debye patterns. Results: Except for those in air, which were higher due to oxidation, the ferrites sintered in different atmospheres showed approximately the same p_{H_2O}/p_{H_2} values with the same degree of reduction. Ferrites containing excess manganese owing to admixture of Mn_3O_4 , showed higher p_{O_2} due to formation of $Mn_3O_4 - MnFe_2O_4$ solid solutions. During the ferrite reduction, the lattice constant of the spinel phase gradually fell until it was roughly the same as for magnetite. At 10% reduction, a lower oxide phase appeared with an NaCl lattice, the constant of which increased as the reduction proceeded. At 45% reduction, a metallic phase appeared, with the lattice constant of iron (2.861 Å). The reduction of manganese ferrite thus proceeds in two stages: (1) Reduction to the lower oxide phase (Fe, Mn)O via formation of non-ideal solid

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Study of equilibrium conditions in...

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solutions of $MnFe_2O_4$ and Fe_3O_4 ; (2) reduction of the lower oxide phase to iron. The activities and the activity coefficients were calculated for the solid solutions (Table 3). There are 6 figures and 3 tables. The most important English-language reference is: P. K. Foster and A. J. E. Welch, Trans. Faraday Soc., 52, 1636, 1956.

ASSOCIATION: Institut metallurgii, Ural'skiy filial Akademii nauk SSSR
(Institute of Metallurgy, Ural Branch of the Academy of Sciences USSR)

SUBMITTED: July 3, 1961

Card 3/4

BRAYNINA, D.Z.; AVERBUKH, B.D.; ZHURAVLEVA, M.G.; CHUFAROV, G.I.

Equilibrium in the reduction of manganese-zinc ferrite by hydrogen.
Zhur.neorg.khim. 9 no.1:230-231 Ja '64. (MIRA 17:2)

1. Ural'skiy filial AN SSSR, Institut metallurgii.

ACCESSION NR: AP4042598

S/0076/64/038/007/1811/1815

AUTHOR: Braynina, D. Z. (Sverdlovsk); Averbukh, B. D. (Sverdlovsk); Zhuravleva, M. G. (Sverdlovsk); Chufarov, G. I. (Sverdlovsk)

TITLE: Equilibrium conditions in the hydrogen reduction of manganese-zinc ferrites

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 7, 1964, 1811-1815

TOPIC TAGS: manganese ferrite, zinc ferrite, manganese zinc ferrite, ferrite reduction, ferrite dissociation, ferrite crystal structure, spinel structure, inverse spinel structure

ABSTRACT: Equilibrium conditions at 700 to 900C for the initial stages of hydrogen reduction of manganese-zinc ferrites of varying composition are investigated. The equilibrium constants were determined experimentally and the equilibrium partial pressures of oxygen following dissociation of the ferrites were calculated. The lattice constants were measured. It was shown that both the equilibrium partial pressure of oxygen and the lattice constants of manganese-zinc ferrites depend in a nonlinear manner on the composition. It

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ACCESSION NR: AP4042598

was found that the dissociation pressure of $Mn_xZn_{1-x}Fe_2O_4$ increases at first from the x value corresponding to a zinc ferrite to a maximum with a 70% zinc ferrite content, then drops to the x value for $MnFe_2O_4$. The change in the constants of the crystal lattices of the solid solutions agrees with the fact that manganese ferrite is inverted by about 20%. Orig. art. has: 5 figures, 1 table, and 2 formulas.

ASSOCIATION: Institut metallurgii. (Institute of Metallurgy)

SUBMITTED: 11Oct63

SUB CODE: MM, SS

NO REF SOV: 005

ENCL: 00

OTHER: 013

Card 2/2

BRAYNINA, D.Z.; MEN', A.N.; CHUDAKOV, V.S.; CHUFAROV, G.I.

Calculation of the "stabilization" energy of iron group ions in oxides having a spinel structure. Dokl. AN SSSR 160 no.2:379-382 Ja '65. (MIRA 18:2)

1. Institut metallurgii, Sverdlovsk. 2. Chlen-korrespondent AN SSSR (for Chufarov).

PROCESS AND PROPERTIES INDEX

a-3

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**Synthesis and structure of dichlorodivinyliodinium and phenyl-
 chlorodivinyliodinium salts.** R. C. Freklina, E. M. Urainina, and
 A. N. Nesmejanov (*Bull. Acad. Sci. U.R.S.S., Cl. Sci. Chim.*, 1948,
 847-854).—Cl₂ shaken for 30 min. with *trans*-CHClCH₂HgCl in
 3% HCl gives the salt, (CHClCH₂)₂ICl₂HgCl, m.p. 140-150°
 (6% yield), an aq. solution of which with H₂S affords *ββ*-dichloro-
 divinylmercury chloride, C₂H₂Cl₂, m.p. 202° (decomp.). SnPh₂Cl
 and CHClCH₂·ICl₂ (12 hr. at room temp.) afford phenyl-*β*-chloro-
 vinylmercury chloride, C₂H₃Cl₂, m.p. 226-230° (decomp.) (mercuri-
 vinylmercury chloride, m.p. 185°). The iodinium salts described above are rela-
 tively thermostable, not evolving C₂H₂ at temp. <180-200°.
 They decompose readily in C₂H₄N₂, aq. HCl, or H₂O at 100°, or in
 aq. NaOH at room temp. R. T.

ASM-ISA METALLURGICAL LITERATURE CLASSIFICATION

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PROCESSING AND PROPERTIES INDEX

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CA

Reaction of aryl iodochlorides with 2-chlorovinylmercury chloride. E. M. Bralinina and R. Kh. Freidlina. *Bull. acad. sci. U.R.S.S., Classe sci. chim.* 1947, 423-30 (in Russian).—Reactions of $ArICl_2$ with $trans-CICH:CH-HgCl$ were investigated. Introduction of a Me group into the Ph ring facilitated the exchange reaction, while introduction of NO_2 suppressed it, as may be expected on the basis of electron displacements caused by these electron-repelling and electron-attracting groups. The reactions of $PhSnCl_2$ with $CICH:CHCl$ and $ICH:CHCl_2$ were also examd.; in the 1st instance $SnCl_2$ and $CICH:CH-HgCl$ were formed (C.A. 40, 4889); in the 2nd instance the products were Ph_2ICl , C_6H_5 , and $SnCl_2$. This is explained by the +I effect for iodine being smaller than that of Cl. $PhICl_2$ (15 g.) and 15 g. $trans-CICH:CH-HgCl$ (I) in 40 ml. 3% HCl, shaken for several hrs. at room temp. until the KI test was neg., gave 9 g. (31%) ppt. which, after washing with $CHCl_3$, m. 133-4° and was identified as $Ph(CICH:CH)ICl.HgCl$, m. 135-7° (from dil. EtOH). Treatment with H_2S , filtration, and evapn. gave phenyl(2-chlorovinyl)iodonium chloride, decomp. 224-6°; picrolonate m. 158.5-0° (from dil. EtOH); I (17.5 picrate m. 107° (decompn.); from dil. EtOH). I (17.5 g.) and 17 g. *o*- $MeC_6H_4ICl_2$ similarly gave (*o*- MeC_6H_4)- $(CICH:CH)ICl.HgCl$, m. 98-9° (from H_2O), 40%; the iodonium chloride itself decomp. 202-3.5° (from H_2O); picrolonate, decomp. 103-2.5° (from dil. EtOH). I (11.3 g.) and 11 g. *p*- $MeC_6H_4ICl_2$ similarly gave (*p*- MeC_6H_4)- $(CICH:CH)ICl.HgCl$, decomp. 151-2° (from dil. EtOH); the iodonium chloride, decomp. 214-15° (from H_2O). I (49.6 g.) and 42.6 g. *p*- $ClC_6H_4ICl_2$ were shaken in 50 ml. 3% HCl 20 hrs. at room temp. without action; on heating to 70° the reaction was complete in 20-30 min., giving 5 g. (6%) (*p*- ClC_6H_4)- $(CICH:CH)ICl.HgCl$, decomp. 142-4° (from dil. EtOH); the iodonium chloride, decomp. 187-8° (from H_2O). Shaking 40 g. *m*- $NO_2C_6H_4ICl_2$ and 36 g. I in 100 ml. 3% HCl 4 hrs. at room temp., followed by sepn. of the pptd. oil and solid, gave, on distn. of the low-boiling halides on a steam bath, 40% *trans*-dichloroethylene, b. 48°, n_D^{20} 1.4465; the residue was distd. with steam, giving 81% *m*- $ClC_6H_4NO_2$; the aq. soln. from the reaction mixt. yielded 85% $HgCl_2$, while the $CHCl_3$ -insol. residue of the reaction mixt. was shown to be *m*- $O_2NC_6H_4(CICH:CH)ICl.HgCl$, decomp. 146-7° (from dil. EtOH) (5%); the iodonium chloride decomp. 170-2° (from H_2O). Under similar conditions, the *o*- and *p*-isomers do not react with the formation of double

METALLURGICAL LITERATURE CLASSIFICATION

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salts. Satn. of *trans*-diiodoethylene in $\text{C}_2\text{H}_2\text{Cl}_2$ with Cl_2 with ice-cooling gave 2-iodovinyl iodochloride, which was filtered off and washed with cold CHCl_3 ; when 3.0 g. of this and 4 g. PhSnCl_2 were stirred with cold 15% HCl for many hrs. until the reaction was complete and the ppt. was exhd. with hot H_2O , the ext. gave, on cooling, 0.9 g. Ph_2ICl , decomp. $224-6^\circ$ (from H_2O); evapn. of the filtrate gave an addnl. amt. of the product (total yield, 80%); *picralonate* decomp. $178.5-9.5^\circ$ (from dil. EtOH). All the aryl(2-chlorovinyl)iodonium chlorides obtained above eliminate C_2H_2 on treatment with dry pyridine, with 10-30% yields. Use of 40% NaOH raises the yield to 54-67% with the *o*-tolyl and *m*-nitro compds. $\text{ICl}_2:\text{CHCl}_3$ with 40% NaOH gives substantial amts. of C_2H_2 , while pyridine raises the yield to 50-60%.

G. M. Kosolapoff

C.A.

Addition of iodine trichloride to unsaturated acids. F. M. Bral'nina and R. Kh. Freidlina (Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1950, 315-20. -- Addn. of 2.04 g. ICl₃ in 5 ml. NaCl soln. to 1 g. (C₆H₅CO₂H); and standing 24 hrs gave, after washing with satd. NaCl, 0.6 g. (20%) iodochloride of α -chloroacrylic acid, m. 144° (cf. Thiele and Peter, *Ber.* 38,

2842(1905)); the product, ClC(CH₂)₂CO₂H, can be crystd. from H₂O. Similarly, (C₆H₅CO₂Me); in 20 days gave

20%; of the corresponding Me₂CC(CCl₂)CO₂H, m. 168-70° (decompn.) (from the crude ppt. by washing with H₂O,

EtOH, and ligroin). Fumaric acid similarly gave in 20 days

57%; Cl₂CHCHClCO₂H, a nonfusible solid, sol. in Et₂O, which with pyridine yields a monopyridine salt, m. 124.5-5.0° (from EtOH). CH₂=CHC(CH₂)₂CO₂H (10.5 g.) and 50 g. iodine in 100 ml. abs. EtOH after 2 days gave 75% of a red oil, b. 91.5-2.0° (evolution of some iodine); assigned the structure ClCH₂CHClCH₂CO₂H; chlorination of this at -30° in petr. ether-CHCl₃ gave a solid, ClCH₂CHClCHClCO₂H, contg. 18.8% active Cl; the latter (1 g.) with 2 g. Ph₃SiCl and 5 ml. 15% HCl at -30° gave overnight 87% Ph₃SiCl, decomp. 220°; *private*, m. 134-7°. G. M. K.

IV. Chlorination with peroxides as catalysts. Chlorination of methyl formate. Shozo Yura (Kyoto Univ.). *J. Chem. Soc. Japan, Ind. Chem. Sect.*, 51, 157-8(1948). -- In scattered light, chlorination of HCO₂Me stopped with the formation of ClCO₂CH₂Cl (I), a slight amt. of ClCO₂CHCl₂ (II) being formed on continued chlorination. In the dark no chlorination occurred, but on addn. of 1% H₂O₂ II was obtained, but decompd. on continued chlorination. In the dark completely dry HCO₂Me gave II in the presence of 1% H₂O₂ and ClCO₂CH₂Cl in the presence of Ac₂O. K. H.

BRAYNINA, E. M.

235T15

USSR/Chemistry - Titanium Organic Compounds 21 Jul 52

"Investigation of the Hydrolysis and Polycondensation of Ethyl Orthotitanate," Acad A.N. Nesmeyanov, E.M. Braynina, R. Kh. Freydina, Inst of Org Chem, Acad Sci USSR

"Dok Ak Nauk SSSR" Vol 85, No 3, pp 571-573

Ethyl orthotitanate reacts with water to form $(C_2H_5O)_8Ti_3O_2$, a polymer with the structure $(C_2H_5O)_3Ti - O - Ti(OC_2H_5)_2 - O - Ti(OC_2H_5)_3$.

235T15

~~BRAYNINA, E. M.~~
BRAYNINA, E. M.

Reaction of reverse disproportionation in the series of organic compounds of titanium. A. N. Nesmeyanov, E. M. Braynina, and R. Kh. Freidlina. *Doklady Akad. Nauk S.S.S.R.* 94, 249-52 (1954); cf. *C.A.* 46, 7038i; 48, 567e; Jennings, et al., *C.A.* 30, 5180i. — Examples of "reverse" disproportionation between $TiCl_4$ and alkoxy derivs. of Ti are described. Thus 2.02 g. $TiCl_4$ added to 7.31 g. $Ti(OEt)_4$ in 10 ml. C_6H_6 with ice cooling gave after a few min. 86% $(EtO)_2TiCl_2$, b_p 177-7.5°, b₁ 136-7°. Similarly 0.02 mole $(EtO)_4Ti$ and 0.02 mole $TiCl_4$ mixed in petr. ether- C_6H_6 with cooling gave 79% $(EtO)_2TiCl_2$, m. 40-50° (with darkening) (from C_6H_6). $(EtO)_4Ti$ (0.01 mole) with 0.033 mole $TiCl_4$ in petr. ether- C_6H_6 similarly gave 84% $EtOTiCl_2$, m. 31-2°. $(PrO)_4Ti$ (0.03 mole) and 0.01 mole $TiCl_4$ in petr. ether- C_6H_6 let stand overnight gave 79% $(PrO)_2TiCl_2$, b_p 136-7°. Similarly 0.01 mole $(BuO)_4Ti$ and 0.03 mole $TiCl_4$ gave 62% $BuOTiCl_2$, m. 45-55° (from C_6H_6). $(BuO)_4TiCl_2$ (0.02 mole) with 0.04 mole $TiCl_4$ gave 53% $BuOTiCl_2$. Thermal decompn. or disproportionation of the above halides during distn. depends on the method of prepn. Thus, $(PrO)_2TiCl_2$ prepd. from $PrOH$ and $TiCl_4$ can be distd. readily (159°/18 mm.), but the same product prepd. from $AcCl$ and $(PrO)_4TiCl_2$ suffers much decompn. on distn. The compds. of the general type $(RO)_2TiCl_2$, cited above, can be usually isolated rapidly in the form of adducts with 1 mole piperidine, which can be purified by crystn. from petr. ether- C_6H_6 but are very hygroscopic. G. M. Kosolapoff]

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BRATNINA, E.M.

USSR:

Reaction of alkyl orthotitanates and titanium tetrachloride in the medium of piperidine. A. N. Nesmeyanov, R. Kh. Freidlina, and E. M. Bratnina (N. D. Zelinskii Inst. Org. Chem., Acad. Sci. U.S.S.R., Moscow). *Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk* 1954, 987-91. — Alkoxytitanium chlorides form stable complexes with piperidine, while (RO)₂Ti and TiCl₄ undergo a disproportionation reaction in piperidine yielding the above complexes in good yields. Mixing 5.3 g. (EtO)₂TiCl with 2.57 g. piperidine in the cold gave cryst. (EtO)₂TiCl·C₄H₁₀NH (from C₄H₁₀-petr. ether); the same formed in 54% yield on mixing 0.84 g. (EtO)₂Ti in 15 ml. C₄H₁₀ with 1.89 g. TiCl₄ in 4 ml. C₄H₁₀ and 3.4 g. piperidine in 5 ml. C₄H₁₀. (PrO)₂TiCl (2.3 g.) in 1 ml. petr. ether gave on addn. of 2 ml. piperidine, cryst. (PrO)₂TiCl·C₄H₁₀NH (from C₄H₁₀). (PrO)₂Ti (2.84 g.) in 3 ml. C₄H₁₀ treated with cooling with 1.72 g. piperidine in 2 ml. C₄H₁₀, followed by 1.9 g. TiCl₄ in 4 ml. C₄H₁₀, the mixt. then heated to 60° 10 min. and

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B-85365-3 June 55

A. N. NESMEYANOV

cooled, gave on addn. of petr. ether 78% $(PrO)_2TiCl_2 \cdot C_6H_9NH_2$. $(EtO)_2TiCl_2$, piperidine, and $TiCl_4$ (0.0031, 0.0133 and 0.0047 mole, resp.) in C_6H_6 gave after 0.5 hr. at 60-5° 79% $(EtO)_2TiCl_2 \cdot C_6H_9NH_2$. Similarly 3.4 g. $(BuO)_2Ti$, 1.7 g. piperidine, and 1.9 g. $TiCl_4$ in C_6H_6 gave 85% $(BuO)_2TiCl_2 \cdot C_6H_9NH_2$, which is formed in 57% yield similarly from $(BuO)_2TiCl_2$, piperidine, and $TiCl_4$. $(PrO)_2Ti$, piperidine and $TiCl_4$ gave 37% $PrOTiCl_2 \cdot C_6H_9NH_2$, while $(BuO)_2Ti$ gave 80% $BuOTiCl_2 \cdot C_6H_9NH_2$, and $(CH_2=CH-CH_2O)_2Ti$ gave $CH_2=CHCH_2OTiCl_2 \cdot C_6H_9NH_2$ in 77% yield. To $(EtO)_2TiCl_2 \cdot C_6H_9NH_2$ (9.5 g.) in C_6H_6 was added 1.4 g. abs. $EtOH$, yielding an immediate ppt. of piperidine-HCl (83%), while the filtrate gave 74% $(EtO)_2Ti$. Similarly, $(PrO)_2TiCl_2 \cdot C_6H_9NH_2$ and $PrOH$ gave 65% $(PrO)_2TiCl_2$ and 93% piperidine-HCl; $BuOH$ and $(BuO)_2TiCl_2 \cdot C_6H_9NH_2$ similarly gave 79% $(BuO)_2TiCl_2$ and 81% piperidine-HCl salt.

2/2

G. M. Kosolapoff

BRAYNINA, K.M.

~~Synthesis of alkoxytitanium bromides and alkoxy-~~
~~titanoxane chlorides. A. N. Nesmeyanov, E. M. Braynina,~~
~~and R. Kh. Freidlina, Bull. Acad. Sci. U.S.S.R., Div.~~
~~Chem. Sci. 1955, 755-60 (Engl. translation).—See C.A. 50,~~
~~9278g. B. M. R.~~

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J
KM

BRAYNINA, Ye. M.

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Synthesis of alkoxytitanium bromides and alkoxy-
titanoxane chlorides. A. N. Nesmeyanov, Ye. M. Braynina,
 and R. Kh. Freidling (Inst. Hetero-org. Compts., Moscow).
 Izvest. Akad. Nauk S.S.S.R., Otdel. Khim. Nauk 1955,
 838-43; cf. C.A. 47, 7433b; Boyd, C.A. 48, 9250g.—All
 expts. described below were performed with rigorous exclu-
 sion of H₂O. (EtO)₂Ti (33.7 g.) in 18 ml. abs. EtOH slowly
 treated with 1.31 g. H₂O in 10 ml. abs. EtOH, refluxed
 briefly, filtered hot, and cooled, yielded 75% (EtO)₂Ti₂O₂ (I),
 m. 78-85° (from EtOH); no other polymer was found in the
 residual soln. I (10.7 g.) heated 2 hrs. with 20 ml. BuOH,
 freed of ROH by distn., heated again with fresh BuOH, and
 the ROH evapd. gave a viscous liquid which could not be
 solidified; heated *in vacuo* to 90°, the product was identified
 as (EtO)₂Ti₂O₂, a very hygroscopic and readily hydrolyzable
 viscous mass. Heating to 220° gave a distillate of (EtO)₂Ti,
 leaving behind a solid polymer. Similar transesterification
 with C₄H₉OH gave a liquid (C₄H₉O)₂Ti₂O₂ (II), which on
 heating to 250-60° yielded (C₄H₉O)₂Ti, b_p 199°, n_D²⁰ 1.4940.
 I (5.36 g.) in 5 ml. petr. ether treated with cooling with 0.78
 g. AcCl in 3 ml. petr. ether, then heated 2 hrs. at 70-5°
 cooled, filtered, and distd., yielded EtOAc and a solid
 residue identified after drying *in vacuo* as (EtO)₂Ti₂O₂Cl, hav-
 ing an indefinite m.p. and sol. in petr. ether, but could not

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Synthesis of alkoxytitanium

be recrystd. Similarly, 4.8 g. I and 1.4 g. AcCl gave a solid $(EtO)_2Ti_2O_2Cl_2$ (from petr. ether). $(BuO)_2Ti_2O_2$ (11.45 g.) and 2.36 g. AcCl in petr. ether- C_2H_6 gave 92% viscous $(BuO)_2Ti_2O_2Cl_2$, which, heated *in vacuo*, yielded, from 4.33 g. starting material, 1.83 g. $(BuO)_2TiCl_2$, b_p 186.5°, n_D^{25} 1.5102, and a solid polymer. II (14.82 g.) and 2.36 g. AcCl similarly gave liquid $(C_2H_5O)_2Ti_2O_2Cl_2$, yielding on distn. a polymer and $(C_2H_5O)_2TiCl_2$, b_p 188-201°, n_D^{25} 1.5000. $(EtO)_2Ti$ (1.14 g.) in 6 ml. C_2H_6 -petr. ether with 1.54 g. $TiBr_4$ in 5 ml. C_2H_6 gave after prolonged cooling to -10° 79% $(EtO)_2TiBr_2$, m. 47-50°. Similarly, 2.28 g. $(EtO)_2Ti$ and 11.03 g. $TiBr_4$ gave 45% $EtOTiBr_2$, a solid with indefinite m.p. (from C_2H_6 -petr. ether). $(EtO)_2Ti$ (2.28 g.) in 3 ml. petr. ether treated with cooling with 1.7 g. piperidine in C_2H_6 , then dropwise with 3.67 g. $TiBr_4$ in C_2H_6 , and kept overnight, yielded 80% $(EtO)_2TiBr_2 \cdot (C_2H_5)_3NH$. Similarly 6.84 g. $(EtO)_2Ti$, 3.4 g. piperidine, and 3.67 g. $TiBr_4$ gave 76% $(EtO)_2TiBr_2 \cdot (C_2H_5)_3NH$; the products can be crystd. from C_2H_6 -petr. ether. G. M. Kosolapoff

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PM

BRAYNINA, E. M.

AUTHORS: Freydlina, R. Kh.; Braynina, E. M.; Nesmeyanov, A. N. 62-1-6/21

TITLE: Interchange Reactions of Zirconium Tetraacetylacetonate (Otmennyye reaktsii tetraacetylatsetonata tsirkoniya)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Otdeleniye Khimicheskikh Nauk, 1957, No. 1, pp. 43-47 (U.S.S.R.)

ABSTRACT: This report is devoted to the study of interchange reactions of zirconium tetraacetylacetonate, which appears to be one of the easily accessible chelate compounds. The possibility of converting zirconium tetraacetylacetonate into other less-accessible chelate compounds of octo-coordination zirconium, was investigated. The conversion into hexacoordinated Zr compounds and into alkylorthozirconates was also studied. It was established that the reaction between zirconium tetraacetylacetonate and benzoyl acetone leads to an interchange between the radicals of one beta-diketone into radicals of another beta-diketone and the formation of zirconium tetrabenzoyl acetone,

Card 1/3

Interchange Reactions of Zirconium Tetraacetylacetonate 62-1-6/21

a product which cannot be obtained by any other method. The reaction of zirconium tetraacetylacetonate with salicylaldehyde leads to the formation of a chelate compound $(OC_6H_4CHO)_4Zr$, a solid product, hardly soluble in organic solvents and easily forming other complexes such as binary compounds with one chloroform molecule $(OC_6H_4CHO)_4Zr \cdot CHCl_3$.

It was found that tetraacetylacetonate and tetrabenzoylacetonate react easily with acetyl chloride forming homologous zirconium chlorides. The reaction of zirconium tetraacetylacetonate with a surplus of butyl and benzyl alcohols gave homologous butylorthozirconate and benzylorthozirconate. It was concluded that the conversion from chelate Zr compounds into simple orthozirconic acid esters is perfectly possible.

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Interchange Reactions of Zirconium Tetraacetylacetonate 62-1-6/21

ASSOCIATION: Academy of Sciences of the USSR, Institute of Elemento-Organic
Compounds

PRESENTED BY:

SUBMITTED: January 21, 1956

AVAILABLE: Library of Congress

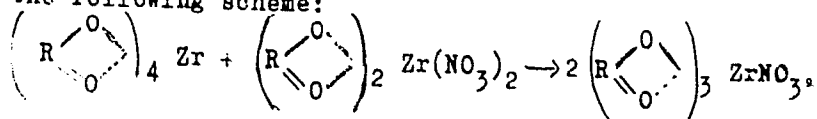
Card 3/3

AUTHORS: Braynina, E. M., Freydlina, R. Kh., Nesmeyanov, A. N. SOV/62-58-8-4/22

TITLE: The Reaction of the Reverse Disproportioning Within the Series of Chelate Zirconium Compounds (Reaktsiya, obratnaya disproporcionirovaniyu, v ryadu kleshneobraznykh soyedineniy tsirkoniya)

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 8, pp. 937-940 (USSR)

ABSTRACT: In the previous paper some exchange reactions of chelate zirconium compounds were described. In the present paper the authors describe other reactions of the same type. The reaction of the reverse disproportioning realized by the example of the interaction of zirconium tetraacetyl acetonate with the di-nitrate of zirconium diacetyl acetonate was of the greatest interest to the authors. The reaction took place according to the following scheme:



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The Reaction of the Reverse Disproportioning Within the Series of Chelate
Zirconium Compounds

SOV/62-58-8-4/22

where $R \begin{matrix} \diagup O \\ \diagdown O \end{matrix}$ represents the acetylacetone residue (or the benzoyl acetone residue, respectively). This reaction may be applied to chelate zirconium compounds. Mononitrates of zirconium triacetyl acetate and of zirconium tribenzoyl acetate were obtained by the interaction of zirconium tetraacetyl acetate and zirconium tetrabenzoyl acetate with the corresponding dinitrates. These mono- and dinitrates can form binary compounds with benzoyl and dioxane. There are 6 references, 3 of which are Soviet.

ASSOCIATION: Institut elementoorganicheskikh soedineniy Akademii nauk SSSR
(Institute of Elemental-Organic Compounds, AS USSR)

SUBMITTED: January 15, 1957

Card 2/2

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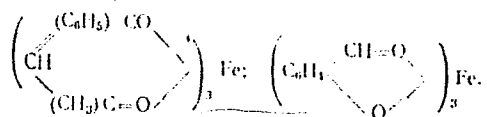
SOV/62-60-1-10/37

AUTHORS: Freydlina, R. Kh., Bruynina, E. M., Nesmeyanov, A. N.

TITLE: Metathetical Reactions of Iron Chelates

PERIODICAL: Izvestiya Akademii nauk. Otdelenie khimicheskikh nauk, 1960, Nr 1, pp 59-62 (USSR)

ABSTRACT: Iron triacetylacetonate undergoes a metathetical reaction with benzoylacetone and salicylaldehyde, forming the corresponding iron chelates:



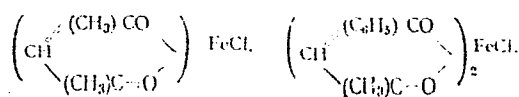
A reverse disproportionation takes place between ferric chloride and iron triacetylacetonate or iron tribenzoylacetone (molar ratio 1:2), forming the corresponding monochloroderivatives of iron:

Card 1/2

Metathetical Reactions of Iron Chelates

78004

SOV/62-00-1-10/37



One chelate radical is replaced by chlorine in the reaction of iron triacetylacetonate and iron tribenzoylacetonate with acetyl chloride. There are 5 references, 3 Soviet, 1 U.S., 1 German. The U.S. reference is: U.S. patent 2659711, Nov. 17, 1953.

ASSOCIATION: Institute of Element-Organic Compounds, Academy of Sciences, USSR (Institut elementoorganicheskikh soyedinenii Akademii nauk SSSR)

SUBMITTED: June 17, 1953

Card 2/2

5.2620

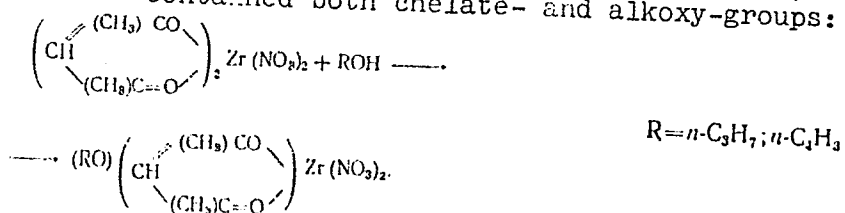
78065
SOV/62-60-1-11/37

AUTHORS: Braynina, E. M., Frydlina, R. Kh., Nesmeyanov, A. N.

TITLE: A New Method of Preparation of Alkoxyderivatives of Zirconium

PERIODICAL: Izvestiya Akademii nauk. Otdeleniye khimicheskikh nauk, 1960, Nr 1, pp 63-67 (USSR)

ABSTRACT: New zirconium derivatives were obtained, which contained both chelate- and alkoxy-groups:

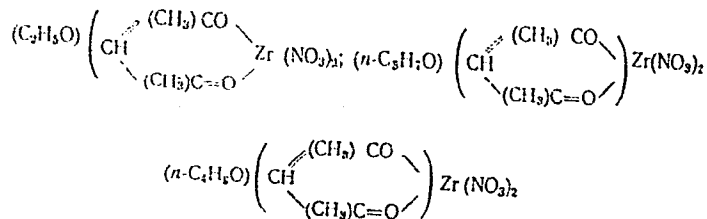


Card 1/3

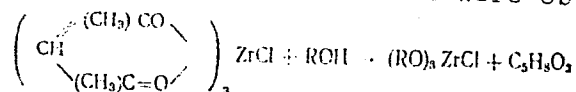
The following compounds were obtained:

A New Method of Preparation of Alkoxyderivatives of Zirconium

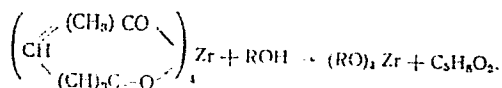
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SOV/62-60-1-11/37



Trialkoxyzirconium chlorides were obtained:



where R = propyl, butyl, hexyl, heptyl, octyl, and nonyl (all normal). Alkyl orthozirconates were prepared in the following manner:



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A New Method of Preparation of
Alkoxyderivatives of Zirconium

78065
SOV/62-60-1-11/37

where R = n-hexyl, n-heptyl, n-octyl and n-nonyl.
There are 6 references, 2 Soviet, 3 U.K., 1 U.S.
The 4 U.S. and U.K. references are: R. C. Mehrotra,
J. Am. Chem. Soc., 76, 226 (1954); D. C. Bradley,
Nature, 165, 75 (1950); the same, J. Chem. Soc.,
2025 (1953); the same, J. Chem. Soc., 3450 (1950).

ASSOCIATION: Institute of Element-Organic Compounds, Academy
of Sciences, USSR (Institut elementoorganicheskikh
soyedinenii Akademii nauk SSSR)

SUBMITTED: June 17, 1958

Card 3/3

22516

5.3700 2209

S/062/61/000/004/005/008
B118/B208

AUTHORS: Braynina, E. M., Freydlina, R. Kh., and Nesmeyanov, A. N.

TITLE: A new method of synthesizing zirconium tetraacyloxy derivatives

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, no. 4, 1961, 608-612

TEXT: The authors of the present paper studied the synthesis of zirconium tetraacyloxy derivatives by allowing zirconium tetraacetyl acetate to react with aliphatic carboxylic acids. Organic acids were found to react when heated with zirconium tetraacetyl acetate, and to give neutral salts, separating acetyl acetone, according to the equation $(C_5H_7O_2)_4Zr + RCOOH \longrightarrow (RCOO)_4Zr + C_5S_8O_2$. This reaction gives a quantitative yield of the end product after 3-8 hr. The reactions of zirconium tetraacetyl acetate with valerianic, capronic, and enanthic acid were performed in the stream of dry nitrogen, by using these acids in excess. Liquid products were obtained which crystallized when stored, but

Card 1/3

22516

S/062/61/000/004/005/008

B118/B208

A new method of synthesizing...

partially decomposed with high-vacuum distillation. Zirconium tetraacetyl acetate reacted with ω -chloro-undecanoic, lauric, palmitic, and stearic acid in a molar ratio of 1 : 4 of the components, in benzene or octane solution. Zirconium tetrapalmitate and zirconium tetrastearate resulted in the form of light powders. They partially decomposed on recrystallization. The advantage of this method is that the products separated from the reaction mixture are analytically pure without further purification. This was confirmed by tests for C, H, Zr, Cl. Substitution of acyloxy groups for the acetyl acetate groups also takes place in the respective manganese and cobalt compounds. Reaction of manganese triacetyl acetate and cobalt triacetyl acetate with palmitic and stearic acid yielded manganese dipalmitate, manganese distearate, and cobalt distearate. The latter could also be obtained by reacting cobalt diacetyl acetate with stearic acid in a dry nitrogen stream. There are 17 references: 3 Soviet-bloc and 14 non-Soviet-bloc. The three references to English-language publications read as follows: R. N. Kapoor, R. C. Mehrotra, Chem.Industr. 68 (1958); R. N. Kapoor, R. C. Mehrotra, J. Chem. Soc. 422 (1959); S. Prasad, V. Rama Reddy, J. Indian Chem. Soc. 35, 907 (1958).

Card 2/3

22516

S/062/61/000/004/005/008
B118/B208

A new method of synthesizing...

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk
SSSR (Institute of Elemental Organic Compounds, Academy of
Sciences USSR)

SUBMITTED: February 6, 1960

Card 3/3

27488

S/062/61/000/009/003/014
B117/B101

5.3700

AUTHORS: Braynina, E. M., and Freydlina, R. Kh.

TITLE: Some disproportionation reactions of organic zirconium-, titanium- and iron compounds

PERIODICAL: Akademiya nauk SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 9, 1961, 1595-1599

TEXT: The preparation of pure crystalline tetraacetoxy-tetraethoxy trititanoxane $(\text{CH}_3\text{CO}_2)_4(\text{C}_2\text{H}_5\text{O})_4\text{Ti}_3\text{O}_2$ by reaction of acetic anhydride with tetraethoxy titanium in molar ratio 2 : 1 is described. The reaction takes place in the absence of atmospheric moisture. The authors studied the reaction of water with tetrabutoxy zirconium at various molar ratios (1 : 2, 2 : 3, 3 : 4, 9 : 10) corresponding to the equation

$$n(\text{C}_4\text{H}_9\text{O})_4\text{Zr} + (n - 1)\text{H}_2\text{O} \rightarrow (\text{C}_4\text{H}_9\text{O})_{2n+2}\text{Zr}_n\text{O}_{n-1} + 2(n - 1)\text{C}_4\text{H}_9\text{OH} \quad (1)$$

since they assumed that the hydrolysis of zirconium alkoxides might yield organic zirconoxane compounds. The products obtained were semi-solid, well soluble in organic solvents and decomposed on high-vacuum distillation.

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27488

S/062/61/000/009/003/014

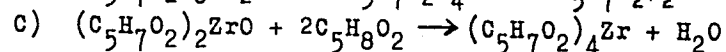
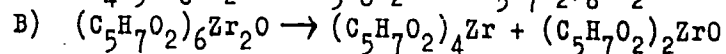
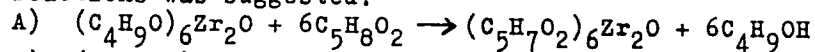
B117/B101

Some disproportionation reactions ...

The hydrolysis products were purified from butyl alcohol traces by drying under vacuum and then analyzed for C, H, and Zr. The analytical data and the molecular weight determined cryoscopically in benzene yielded the compounds $(C_4H_9O)_6Zr_2O$; $(C_4H_9O)_8Zr_3O_2$; $(C_4H_9O)_{10}Zr_4O_3$, and $(C_4H_9O)_{32}Zr_{10}O_9$.

The reproducibility of the molecular weight determination is insufficient, however, since the benzenic solutions of all the hydrolysis products becomes turbid after a few hours. Treatment of the Zr_2 or Zr_3 compound

with acetylacetone or benzoyl acetone led to zirconium tetraacetylacetonate or, respectively, zirconium tetrabenzoylacetonate and not, as had been expected, to chelate-type compounds with Zr-O-Zr groups. The following reactions was suggested:



The hydrolysis of crystalline zirconium isopropoxy-triacetylacetonate does not yield the Zr_2 compound either, but gives zirconium tetraacetylacetonate.

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Some disproportionation reactions ...

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S/062/61/000/009/003/014
B117/B101

This reaction probably involves a disproportionation, similar to that in scheme B). Zirconium triacetylacetonate chloride, zirconium tribenzoylacetonate nitrate, iron diacetylacetonate chloride and iron dibenzoylacetonate chloride undergo similar disproportionation reactions under the influence of water. O. V. Nogina observed a similar phenomenon in the reaction of acetylacetone with octaethoxy trititanoxane. Zirconium isopropoxy-triacetylacetonate and zirconium tri-n-propoxy-acetylacetonate were obtained by reaction of zirconium tetraacetylacetonate with isopropyl alcohol or n-propyl alcohol respectively. There are 1 table and 12 references: 8 Soviet and 4 non-Soviet. The reference to the English-language publication reads as follows: R. N. Kapoor, R. C. Mehrotra, J. Chem. Soc. 1959, 422.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Elemental Organic Compounds of the Academy of Sciences USSR)

SUBMITTED: February 21, 1961

Card 3/3

BRAYNINA, E.M.; MINACHEVA, M.Kh.; FREYDLINA, R.Kh.

Sulfenation of cyclopentadienyl zirconium compounds. Izv. AN SSSR.
Otd.khim.nauk no.9:1716 S '61. (MIRA 14:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.
(Zirconium compounds)

BRAYNINA, E.M.; MINACHEVA, M.Kh.; FREYDLINA, R.Kh.; NESMEYANOV, A.N.,
akademik

Cobalt, nickel, and manganese alcoholates. Dokl. AN SSSR 138 no.3:
598-600 My '61. (MIRA 14:5)

1. Institut elementoorganicheskikh soyedineniy AN SSSR. 2. Chlen-
korrespondent AN SSSR (for Freydlina).
(Alcoholates)

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S/020/61/138/006/017/019
B103/B215

AUTHORS: Freydlina, R. Kh., Corresponding Member AS USSR, Braynina, E. M., and Nesmeyanov, A. N., Academician

TITLE: Synthesis of mixed chelate cyclopentadienyl compounds of zirconium

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 138, no. 6, 1961, 1369-1372

TEXT: The authors continued their studies on transformation reactions of chelate compounds of transition metals (Ref. 5: Izv. AN SSSR, OKhN, 1957, 43; Ref. 6: ibid. 1960, 59; Ref. 7: ibid. 63), and studied the interaction of sodium cyclopentadienide with zirconium dichloride diacetyl acetyl acetate. They obtained the mixed compound $C_5H_5(C_5H_7O_2)_2ZrCl$ which also forms in almost quantitative yields by interaction between dicyclopentadienyl zirconium dichloride and an excess of acetyl acetone. The authors assume that this type of reactions might be a way of synthesizing analogous mixed zirconium compounds containing other chelate groups. The substances synthesized by the authors are colorless, crystalline, and soluble in chloroform at room temperature, in benzene and tetrahydrofuran when heated, Card 1/6

25341

Synthesis of mixed ...

S/020/61/138/006/017/019
B103/B215

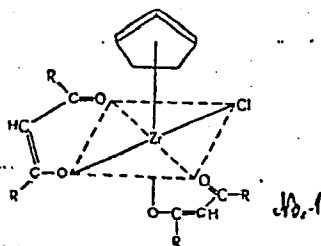
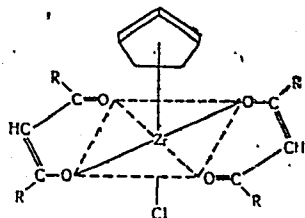
and insoluble in petroleum ether. Their properties are similar to those of dihaloid dicyclopentadienyl compounds of zirconium. The authors assume that the zirconium compounds of the substances produced are of octahedral structure. Should this assumption be correct, they probably correspond to

Card 2/6

Synthesis of mixed ...

25341

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B103/B215



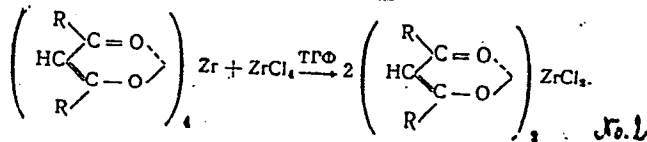
Card 3/6

2501

Synthesis of mixed ...

S/020/61/138/006/017/019
B103/B215

given for cis- and trans-isomers. The authors thank L. A. Kazitsina (spektral'naya laboratoriya Moskovskogo universiteta (Spectral Laboratory of Moscow University)) for taking the infrared absorption spectra which are not in disagreement with the assumed structure of the above-mentioned mixed compound. The authors developed a simple method of synthesizing hitherto hardly obtainable chelate zirconium compounds which serve as initial substances for mixed compounds. It is based upon the interaction of zirconium tetrachloride with complete chelate zirconium compounds:



(TF Φ = tetrahydrofuran). The experimental part describes the production of the following compounds: (1) Dicyclopentadienyl zirconium dichloride whose isolation (G. Wilkinson, P. L. Pauson et al. (Ref. 1; J. Am. Chem.

Card 4/6

2534R

S/020/61/138/006/017/019
B103/B215

Synthesis of mixed ...

Soc., 75, 1011 (1953)); G. Wilkinson, J. M. Birmingham (Ref.2: ib. 76, 4281 (1954)) was simplified by the authors and whose yield was increased. (2) Diacetyl acetate cyclopentadienyl zirconium monochloride forms: (A) by heating substance (1) together with acetyl acetone for 2 hr at 70-80°C and reduced pressure; (B) from zirconium dichloride diacetyl acetate (synthesis of the latter see below, item (4)) in nitrogen atmosphere by 2 hr stirring at room temperature with equimolar amounts of sodium cyclopentadienide. (3) Dibenzoyl acetate cyclopentadienyl zirconium monochloride. A benzene solution of (1) with benzoyl acetone was heated for 15 hr at 95-100°C and reduced pressure. (4) Zirconium dichloride diacetyl acetone from zirconium tetraacetyl acetate and zirconium tetrachloride by 2 hr stirring at 40°C. (5) Zirconium dichloride dibenzoyl acetate produced from zirconium tetrabenzoyl acetate in analogy to (4). Syntheses (1) and (3)-(5) were carried out in tetrahydrofuran. There are 10 references: 4 Soviet-bloc and 6 non-Soviet-bloc. Two references to English-language publications see above: the third one reads as follows: L. T. Reynolds, G. Wilkinson, J. Inorg. and Nucl. Chem. 9, 86 (1959). X

Card 5/6

Synthesis of mixed ...

2534i
S/020/61/138/006/017/019
B103/B215

ASSOCIATION: Institut elementoorganicheskikh soyedineniy (Institute of
Elemental Organic Compounds)

SUBMITTED: February 4, 1961

Card 6/6

ACCESSION NR: AP3000125

S/0062/63/000/005/0835/0838

AUTHOR: Braynina, E. M.; Freydina, R. Kh.

TITLE: Cyclopentadiene compounds of zirconium containing acyloxy groups

SOURCE: AN SSSR. Izvestiya. Otdeleniye khimicheskikh nauk, no. 5, 1963, 835-838

TOPIC TAGS: cyclopentadiene compounds of zirconium, acyloxy groups, cyclopentadienyl zirconium triacetate, cyclopentadienyl zirconium trivalerate

ABSTRACT: A method was developed for preparing acyloxyated cyclopentadienyl zirconium compounds by action of carboxylic acids on cyclopentadienyl zirconium compounds. Thus dicyclopentadienyl zirconium dichloride reacted with acetic, valeric, or enanthic acid to form cyclopentadienyl zirconium triacetate, -trivalerate, or -trienanthate. The triacetate of cyclopentadienyl zirconium reacted with benzoic acid or with acetyl acetone to form the tribenzoate of cyclopentadienyl zirconium, or the acetate of cyclopentadienyl zirconium-diacetylacetonate, respectively. Dicyclopentadienyl zirconium dichloride reacted with trifluoroacetic acid to form the bis-trifluoroacetate of cyclopentadienyl zirconium, which yields the starting products if treated with HCl. Orig. art. has: 4 equations.

Card 1/2

ACCESSION NR: AP3000125

ASSOCIATION: Institut elementoorganicheskikh soedineniy Akademii nauk SSSR
(Institute of Organoelemental Compounds, Academy of Sciences SSSR)

SUBMITTED: 20Jun62

DATE ACQ: 12Jun63

ENCL: 00

SUB CODE: CH

NO REF SOV: 001

OTHER: 000

Card 2/2

ACCESSION NR: AP4016507

S/0020/64/154/005/1113/1115

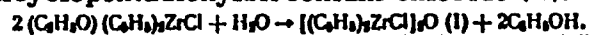
AUTHOR: Braynina, E. M.; Freydina, R. Kh. (Corresponding member);
Nesmeyanov, A. N. (Academician)

TITLE: Cyclopentadienyl compounds of zirconium containing the Zr-O-Zr group

SOURCE: AN SSSR. Doklady*, v. 154, no. 5, 1964, 1113-1115

TOPIC TAGS: cyclopentadienyl zirconium compound, Zr-O-Zr group, zirconoxane compound, tetracyclopentadienyldizirconoxane dichloride, dicyclopentadienylzirconium dichloride hydrolysis, IR spectrum

ABSTRACT: Tetracyclopentadienyldizirconoxane dichloride (I) was prepared by hydrolysis of ethoxydicyclopentadienylzirconium chloride (II):



Compound (I) may also be prepared by hydrolysis of dicyclopentadienylzirconium dichloride (III) in water in the presence of alcohol and an amine. Compounds of the (II) type are prepared by reaction of compound (III) with an alcohol in the

Card 1/3

ACCESSION NR: AP4016507

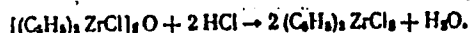
presence of triethylamine:



Compound (I) reacts with acetylacetone to form cyclopentadienyldiacetylacetonate of zirconium chloride:



and compound (I) reacts with HCl to form compound (III):



Compound (I) is a crystalline compound, readily decomposed, soluble in benzene and chloroform, and insoluble in hexane and ether. It was identified by its elemental analysis, molecular weight and IR spectrum. It is suggested that the compound identified as $C_{10}H_9ZrCl$ (E. Samuel and R. Setton, C. R., 256, no. 2, 443 (1963)) is actually the above compound (I). "IR spectra were obtained in the Spectroscopic Laboratory of the Institute of Natural Compounds AN SSSR by G. G. Dvoryantsev, for which we express deep appreciation." Orig. art. has: 5-equations.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR

Card 2/3

ACCESSION NR: AP4016507

(Institute of Organometallic Compounds, Academy of Sciences SSSR)

SUBMITTED: 22Oct63

DATE ACQ: 12Mar64

ENCL: 00

SUB CODE: CH

NO REF SOV: 002

OTHER: 002

3/3

Card

BR

ACCESSION NR: AP4041402

S/0020/64/156/006/1375/1378

AUTHOR: Braynina, E. M.; Dvoryantseva, G. G.; Freydina, R. Kh. (Corresponding member AN SSSR)

TITLE: Cyclopentadienyl dizirconoxirane compounds containing aryl or chelate-forming groups

SOURCE: AN SSSR. Doklady*, v. 156, no. 6, 1964, 1375-1378

TOPIC TAGS: cyclopentadienyldizirconoxirane derivative, arylcyclopentadienyldizirconoxirane compound, synthesis, diphenyltetracyclopentadienyldizirconoxirane, di p tolyltetracyclopentadienyldizirconoxirane, tetracyclopentadienyldizirconoxirane dichloride, dicyclopentadienyldizirconoxirane tetraacetylacetonate, tetracyclopentadienyldizirconoxirane, structure, IR spectra

ABSTRACT: New cyclopentadienyldizirconoxirane compounds containing phenyl, p-tolyl and acetylacetonate groups were synthesized. Dicyclopentadienyldizirconium dichloride was reacted with phenyllithium to produce diphenyltetracyclopentadienyldizirconoxirane (I): $(C_5H_5)_2ZrCl_2 + C_6H_5Li \xrightarrow{-H_2O} (C_6H_5)(C_5H_5)_2ZrOZr(C_5H_5)_2(C_6H_5)H_2O$.

Card 1/3

ACCESSION NR: AP4041402

Di-p-tolyltetracyclopentadienyldizirconoxirane was prepared similarly from p-tollyllithium. I reacted with Cl_2 to form tetracyclopentadienyldizirconoxirane dichloride (II). II reacted with phenyllithium to form I. The diacetylacetonate of cyclopentadienylzirconium chloride was hydrolyzed to the tetraacetylacetonate of dicyclopentadienyldizirconoxirane: $(\text{C}_5\text{H}_5)(\text{C}_5\text{H}_7\text{O}_2)_2\text{ZrCl} + \text{H}_2\text{O} \rightarrow (\text{C}_5\text{H}_5)(\text{C}_5\text{H}_7\text{O}_2)_2\text{ZrOZr}(\text{C}_5\text{H}_5)(\text{C}_5\text{H}_7\text{O}_2)_2$. Dicyclopentadienyldizirconium dibromide was hydrolyzed to the dibromide of tetracyclopentadienyldizirconoxirane. The structures of these compounds were proven by chemical and IR spectral analysis. Characterizing frequencies of the IR spectra are tabulated. Orig. art. has: 1 table and 4 equations.

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Organometallic Compounds, Academy of Sciences, SSSR) Institut khimii prirodnykh soyedineniy Akademii nauk, SSSR (Institute of the Chemistry of Natural Compounds, Academy of Sciences SSSR)

Card 2/3

ACCESSION NR: AP4041402

SUBMITTED: 20Mar64

SUB CODE: 00

ENCL: 00 :

NR REF SOV: 003

OTHER: 000

Card 3/3

L 17852-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM

ACCESSION NR: AP4044701

S/0062/64/000/008/1417/1421

AUTHORS: Freydlina, R.Kh.; Braynina, E.M.; Minacheva, M.Kh.; Nesmeyanov, A.N. ³

TITLE: Electrophilically substituted cyclopentadienylzirconium compounds ⁷

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 8, 1964, 1417-1421

TOPIC TAGS: cyclopentadienylzirconium compound, organozirconium compound, monocyclopentadienylzirconium compound,

zirconium compound, sulfonation, cyclopentadienylzirconium tri- dicyclopentadienyl-sulfate

ABSTRACT: Mono- and dicyclopentadienylzirconium compounds were sulfonated; structures of the products were determined. Monocyclopentadienylzirconium triacetate and H_2SO_4 in the presence of acetic anhydride formed the binary compound $C_5H_5Zr(OSO_3H)_3 \cdot 7 \cdot (CH_3CO)_2O$ in which the acetic anhydride molecule could be exchanged by dimethylformamide. This binary compound, the monocyclopentadienylzirconium ⁷
1/3

L 17852-65

ACCESSION NR: AP4044701

tribisulfate with acetic anhydride was sulfonated with SO_3 in dichlorethane to form the hydroscopic sulfocyclopentadienylzirconium tribisulfate. Dicyclopentadienylzirconium dichloride was sulfonated with H_2SO_4 in acetic anhydride to the binary cyclopentadienyl(sulfocyclopentadienyl)zirconium dibisulfate with 1 or 2 molecules of acetic anhydride: $\left[(\text{C}_5\text{H}_5)(\text{C}_5\text{H}_4\text{SO}_3\text{H})\text{Zr}(\text{OSO}_3\text{H})_2 \right] \cdot n(\text{CH}_3\text{CO})_2\text{O}$, $n = 1$ or 2. In the compound where $n = 1$, the acetic anhydride was exchanged for ethanol or dimethylformamide: $\left[(\text{C}_5\text{H}_5)(\text{C}_5\text{H}_4\text{SO}_3\text{H})\text{Zr}(\text{OSO}_3\text{H})_2 \right] \cdot \text{C}_2\text{H}_5\text{OH}$ or $\left[(\text{C}_5\text{H}_5)(\text{C}_5\text{H}_4\text{SO}_3\text{H})\text{Zr}(\text{OSO}_3\text{H})_2 \right] \cdot 3(\text{CH}_3)_2\text{CHNO}$.

Reaction of these dibisulfates with acetylacetone resulted in the exchange of the unsubstituted cyclopentadienyl group and one of the HSO_4 groups for acetylacetonate to form the binary diacetylacetonate(sulfocyclopentadienyl)zirconium bisulfate with acetylacetonate: $\left[(\text{C}_5\text{H}_4\text{SO}_3\text{H})(\text{C}_5\text{H}_7\text{O}_2)_2\text{Zr}(\text{OSO}_3\text{H}) \right] \cdot \text{C}_5\text{H}_8\text{O}_2$. It was found that the sulfo derivatives of cyclopentadienylzirconium compounds do not exchange the bisulfate group for chloride in excess HCl , although in the analogous acyloxy derivatives the anion exchanged readily. This is similar to the behavior of inorganic zirconium sulfates (as opposed to zirconium nitrate) where sulfate anion exchange was difficult. We sincerely thank Ye.A. Terent'yev and M.V. Bernatsk for

Cord 2/3

L 17852-65

ACCESSION NR: AP4044701

polarographic determination of zirconium and sulfur in the compounds we synthesized." Orig. art. has: 1 equation

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Organometallic Compounds Academy of Sciences SSSR)

SUBMITTED: 21Dec62

ENCL: 00

SUB CODE: CC, CC

NR REF SOV: 007

OTHER: 011

Card 3/3

L 17853-65 ENT(m)/EPF(c)/EWP(j) Pc-h/Pr-h RM

ACCESSION NR: AP4044702

S/0062/64/000/008/1421/1425

AUTHORS: Braynina, E.M; Freydlina, R.Kh.

TITLE: Reverse disproportionation reactions for zirconium compounds containing cyclopentadienyl and chelate forming groups

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 8, 1964, 1421-1425

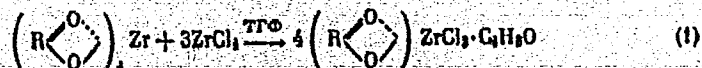
TOPIC TAGS: organo zirconium compound, disproportionation reaction, reverse disproportionation reaction, cyclopentadienylzirconium compound, zirconium chelate compound, polyacetylacetonate zirconium derivative, chelated zirconium chloride, chelated zirconium dichloride

ABSTRACT: The disproportionation reaction was used in synthesizing a new class of zirconium chelate compounds: depending on the ratios of the reactant $ZrCl_4$ and of the 8-coordinate chelate-forming compound of zirconium, it was possible to obtain the mono-, di-, or tri-chlorides of the zirconium chelate-forming compounds. Reaction of zirconium tetraacetylacetonate or of zirconium tetra-3-n-butylacetylacetonate with $ZrCl_4$ (1:3 molar ratio) in tetrahydrofuran resulted in the binary compounds, the trichlorides of zirconium acetylacetonate
Card 1/3

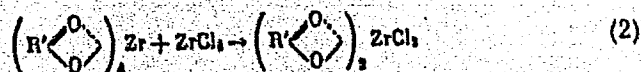
L 17853-65

ACCESSION NR: AP4044702

(or zirconium 3-n-butylacetylacetonate) with tetrahydrofuran:

where $\text{R} \begin{array}{c} \text{O} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$ is acetylacetonate or 3-n-butylacetylacetonate.

Using equimolar proportions of the ZrCl_4 and of the beta-diketone zirconium derivatives resulted in the formation of the dichlorides of zirconium di-3-n-butylacetylacetonate or of zirconium bisdibenzoylmethanate:

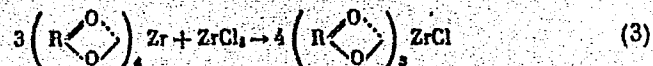
where $\text{R}' \begin{array}{c} \text{O} \\ \diagdown \quad \diagup \\ \text{O} \end{array}$ is dibenzoylmethanate or 3-n-butylacetylacetonate. A

1:3 molar ratio of ZrCl_4 :zirconium tetraacetylacetonate gave the monochloride of zirconium triacetylacetonate:

Card 2/3

L 17853-65

ACCESSION NR: AP4044702



The reverse disproportionation reaction was also used with complex zirconium compounds containing cyclopentadienyl, chelate-forming groups and halides: reaction of zirconium tetracetylacetonate with dicyclopentadienylzirconium dichloride (dibromide) gave the monochloride (monobromide) of zirconium cyclopentadienyldiacetylacetonate:



Orig. art. has: 4 equations

ASSOCIATION: Institut elementoorganicheskikh sovedineniy Akademii nauk SSSR (Institute of Organometallic Compounds Academy of Sciences SSSR)

SUBMITTED: 21Dec62

ENCL: 00

SUB CODE: GG

NR REF SOV: 003

OTHER: 002

Card 3/3

FREYDLINA, R.Kh.; BRAYNINA, E.M.; MINACHEVA, M.Kh.; NESMEYANOV, A.N.

Electrophilic substitution of cyclopentadienyl compounds of
zirconium. Izv. AN SSSR. Ser. khim. no.8:1417-1421 Ag '64.
(MIRA 17:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

BRAYNINA, E.M.; FREYDLINA, R.Kh.

Reactions inverse to diproportionation for zirconium compounds containing cyclopentadienyl and chelate groups. Izv. AN SSSR. Ser. khim. no.3:1421-1425 Ag '64. (MIHA 17:9)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

BRAYNINA, E.M.; MINACHEVA, M.Kh.; FREYDLINA, R.Kh.

Some properties of tetracyclopentadienylzirconium. Izv. AN SSSR.
Ser.khim. no.10:1877-1879 '65. (MIRA 18:10)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

L 437:1-66 EWT(m)AETP(j) RM
ACC NR: AP6024393 SOURCE CODE: UR/0020/66/169/002/0335/0338

AUTHOR: Braynina, E. M.; Mortikova, Ye. I.; Petrashkevich, L. A.; Freydina, R. Kh.
(Corresponding member AN SSSR)

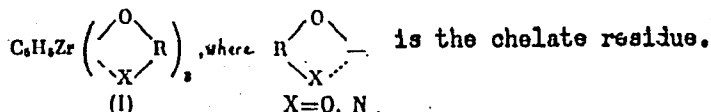
ORG: Institute of Organometallic Compounds, Academy of Sciences, SSSR (Institut
elementoorganicheskikh soyedineniy Akademii nauk SSSR) 24
B

TITLE: New class of cyclopentadienyl zirconium compounds containing chelate groups

SOURCE: AN SSSR. Doklady, v. 169, no. 2, 335-338

TOPIC TAGS: organozirconium compound, chelate compound

ABSTRACT: The paper describes several variants for the synthesis of a series of representatives of a heretofore unknown class of organozirconium compounds containing one cyclopentadienyl (or methylcyclopentadienyl) and three chelate groups:



Apparently, the electron configuration of xenon has been successfully achieved for zirconium in these compounds for the first time. The most generally applicable method for synthesizing this class of compounds consists in reacting tetracyclopentadienyl-

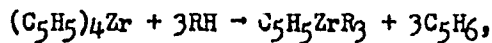
Card 1/2

UDC: 247.255.31

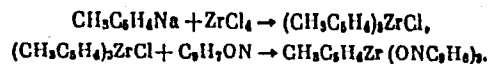
I 45711-66

ACC NR: AP6024393

zirconium with chelate-forming compounds such as 8-hydroxyquinoline, acetylaceton, benzoylaceton and dibenzoylaceton. The reaction takes place rapidly under mild conditions and gives good yields:



where R = C₉H₆ON; C₅H₇O₂; C₁₀H₉O₂; C₁₅H₁₁O₂. Another synthesized compound was tris(8-hydroxyquinolate)methylcyclopentadienylzirconium:



The compounds were monomeric, fusible, and stable toward hydrogen. Their IR spectra were analyzed.

SUB CODE: 07/ SUBM DATE: 11Dec65/ ORIG REF: 004/ OTH REF: 001

Card 2/2ULR

BEZUGLOV, V.P.; BRAYNINA, ~~E~~S.

Biologically active substances in the blood in scarlet fever.
Zhur.mikrobiol. i immun. no.5:24-32 My '55. (MIRA 8:7)

1. Iz kafedry patologicheskoy fiziologii (zav.-prof. I.I.Fedorov)
i kafedry infeksionnykh bolezney (zav.-prof. G.I.Khomenko) L'vov-
skogo Meditsinskogo instituta (dir.-prof. L.N. Kuzmenko)

(SCARLET FEVER, blood in
acetylcholine & sympathin)

(BLOOD,
acetylcholine & sympathin in scarlet fever)

(CHOLINE, in blood,
in scarlet fever)

(SYMPATHINS, in blood,
in scarlet fever)

ACCESSION NR: AP5006593

S/0142/64/007/006/0723/0731

AUTHOR: Braynina, I. S.

TITLE: Evaluation of the traffic capacity of some variable-parameter radio channels

SOURCE: IVUZ. Radiotekhnika, v. 7, no. 5, 1964, 723-731

TOPIC TAGS: radio channel, radio channel traffic capacity

ABSTRACT: Based on investigations of slow and smooth fluctuations of radio-channel parameters by V. I. Siforov and others, the present article tries to theoretically determine the traffic-carrying capacity of such channels when the arriving-signal amplitude (or the channel transmission factor) is distributed according to a "converted χ^2 " law (defined by D. D. Kloviskiy, Radiotekhnika, 1960, v. 14, no. 9, 3). The connection between the above law and the generalized Rayleigh law is established; it is shown that the former may serve as a good

Card 1/2

ACCESSION NR: AP5006593

approximation of the latter. A ratio of possible average rate of information transmission via the above type channel to the rate of transmission via a constant-parameter channel (with the same average power of the signal) is given by an integral equation (23) and its solution (35). Some numerical evaluations are also given. Orig. art. has: 2 figures and 50 formulas.

ASSOCIATION: none

SUBMITTED: 06Aug62

ENCL: 00

SUB CODE: EC

NO REF SOV: 007

OTHER: 001

Card 2/2

BRAYNINA, Kh.A.; KIVA, N.K.

Use of graphite electrode in inversion oscillographic polarography. Ukr. khim. zhur. 30 no.7:697-701 '64 (MIRA 18:1)

1. Donetskiiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv.

L 27302-65 ENT(m)/ENP(t)/ENP(b) IJP(c) JD/JG
REGISTRATION NR: AP5002168

3/0032/65/031/001/0028/0030

12
10
B

AUTHORS: Braynina, Kh. Z.; Ryagaylo, T. A.

TITLE: Determination of cerium in mixtures of rare earth elements by the film polarographic method

SOURCE: Zavodskaya laboratoriya, v. 31, no. 1, 1965, 26-30

TOPIC TAGS: polarographic analysis, cerium, electrolysis, rare earth element, rare earth/ 7 77 4/B polarograph

ABSTRACT: Determination of cerium in mixtures of rare earth elements by the film polarographic method was investigated. The element in question was concentrated in the form of cerium hydroxide (IV) on a graphite electrode in an acetate buffer solution, with subsequent electro-dissolving of the precipitate. The maximum cathodic current is proportional to the Ce(III) ion concentration. The method has a sensitivity of $4 \cdot 10^{-5} - 10^{-3}$ and forms an extension of the method described by Kh. Z. Braynina (Zhurnal analiticheskoy khimii, 18,10,1168, 1963). A model 7-77-4/B recording polarograph was used in conjunction with previously described equipment (Sb. "Metody analiza khimicheskikh reaktivov i preparatov," IKhA, vyp. 5-6, pp. 110 i 129, 1963) in an acetic buffer solution (0.1-n $\text{NaCH}_3\text{COO} + 0.1-n \text{CH}_3\text{COOH}$)
Card 1/4

Z 27302-65

ACCESSION NR: AP5002168

2

containing 50 gm/liter La, 50 gm/liter (Nd+Pr) and 10 gm/liter Y (pH = 4-5). As shown in Fig. 1 on the Enclosure, the optimum electrolysis potential is +1.0 volts. The maximum dissociation currents as a function of Ce(III) ion concentration (see Fig. 2 on the Enclosure) were found to be linear over a wide operating range. Orig. art. has: 3 figures and 1 table.

ASSOCIATION: Donatskiy filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv (Donets Branch of the All-Union Scientific Research Institute for Chemical Reagents and High Purity Chemical Substances)

SUBMITTED: 00

ENCL: 02

SUB CODES: IC, IM 16

NO REF SOV: 00b

OTHER: 001

Card 2/4

L 27302-65

ACCESSION NR: AF5002169

ENCLOSURE: 01

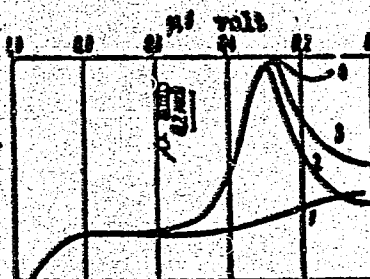


Fig. 1. Polarisation curves of cerium hydroxide (IV) electroplated from a solution containing $2 \cdot 10^{-3}$ M Ce(IV) in 1 minute at potentials of 0.6; 1.0; 1.3 and 1.6 volts (curves 1-4 respectively)

Card 3/4

I. 27302-65

ACCESSION NR: AF5002168

ENCLOSURE: 02

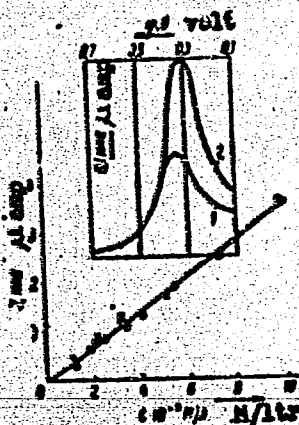


Fig. 2. Maximum current during electrodisassociation of cerium hydroxide (IV) versus Ce(III) ion concentration; 1 - 10^{-5} M, Ce(III) (crosses); 2 - 10^{-4} M, (stipple)

bjo
Cord 1/4

I 53919-65 ENG(j)/EWP(e)/EWT(m)/EPT(c)/EWP(1)/EWG(m)/T/EPR/EWP(t)/EWP(b)
P1-4/Ps-4 LJP(c) RWH/JD/NW/WH

ACCESSION NR: AP5011422

UR/0073/65/031/004/0398/0402

33
32
B

AUTHOR: Braynina, Kh. Z., Belyavskaya, V. B.

TITLE: Reproducibility and accuracy of the polarographic determination of trace amounts of metals with their preliminary concentration on a graphite electrode

SOURCE: Ukrainskiy khimicheskiy zhurnal, v. 31, no. 4, 1965, 398-402

TOPIC TAGS: metal microanalysis, polarography, graphite electrode, metal concentration, lead determination, copper determination

²⁷ ABSTRACT: ²⁷ The article is devoted to the study of the behavior of various kinds of graphite electrodes and aims at the selection of the optimum conditions for obtaining stable results during the concentration of trace metals. A comparative evaluation of various solid electrodes in the polarographic analysis of trace amounts of lead and copper was carried out. With lead as an example, it was shown that a graphite electrode can be used as the working electrode in polarographic analysis involving a preliminary concentration of the metal in the form of a deposit on the graphite electrode and the recording of the electrodisolution currents. The proposed method, which is highly reproducible, is applicable to the determination of trace amounts of metals in compounds that are more electronegative than the impurity being determined. The error of the determination does not exceed 12% in the
Card 1/2

L 53919-65

ACCESSION NR: AP5011422

analysis of solutions containing 10^{-7} mole of the impurity being analyzed per liter. Orig. art. has: 6 figures, 5 formulas and 1 table.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv, Donetskii filial (All-Union Scientific Research Institute of Chemical Reagents and High-Purity Substances, Donets Branch)

SUBMITTED: 10Nov63

ENCL: 00

SUB CODE: GC, OF

NO REF SOV: 006

OTHER: 005

SAC
Card 2/3

BRAYNINA, Kh.Z.

Concentration of elements of variable valency as sparingly soluble compounds in polarographic analysis. Trudy Kom. anal. khim. 15:185-194 '65.
(MIRA 18:7)

VASSERMAN, I.M.; BRAYNINA, Kh.Z.

Chemical "aging" of basic nickel carbonate precipitate and conditions
affecting the use of sodium carbonate in the precipitation process.
Zhur.prikl.khim. 31 no.11:1617-1624 N '58. (MIRA 12:2)
(Nickel carbonates) (Sodium carbonates) (Precipitation (Chemistry))

BRAYNINA, Kh. Z. Cand Chem Sci -- "Study of ~~the~~ ^{losses} current ~~decay~~ on polarographic waves of indium and gallium." Stalino, 1960 (All-Union Sci Res Inst of Chem Reagents. Stalino Affiliate) (KL, 1-61, 181)

S/153/60/003/004/010/040/XX
B023/B054

AUTHORS: Chirkov, S. K., Braynina, Kh. Z., Kochanova, G. M.

TITLE: Use of Polyvinyl Alcohol in Polarography

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i
khimicheskaya tekhnologiya, 1960, Vol. 3, No. 4,
pp. 600 - 603

TEXT: The authors studied the effect of polyvinyl alcohol on the re-
duction of Cu-, Cd-, and Zn ions on a dropping mercury electrode from a
chloride ammonium solution. The investigation of the applicability of
polyvinyl alcohol for this purpose was suggested by Professor A.A. Tager,
who is thanked by the authors. The studies were conducted on a visual
polarograph of the УФАН (UFAN) system. The amperage was measured with a
reflecting galvanometer of the type M-21 (M-21). The potential of the
mercury electrode was measured by the compensating method referred to a
saturated calomel electrode. This calomel electrode, which was connect-
ed with the electrolyzer by a low-resistance electrolytic bridge, served
as anode. The mercury was previously distilled in vacuo. All solutions

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were prepared with doubly distilled water. The salts of the minerals studied (copper-, cadmium-, and zinc sulfates) were twice recrystallized from the doubly distilled water. After previous swelling in a small amount of water, the polyvinyl alcohol (molecular weight 25,000) was dissolved. The cations were polarographed on a chloride-ammonium background (1.5N NH_4Cl ; 1.5N NH_4OH) with an addition of 4.0 g of crystalline sodium sulfite on 100 ml of solution. The ammonia was distilled in a glass apparatus. Ammonium chloride and sodium sulfite were recrystallized from doubly distilled water. Figs. 1-3 show the results. The upper curve (Fig. 1) has two maxima whose character has not yet been determined. Polyvinyl alcohol suppresses current maxima on all curves studied. A table shows that, in the presence of polyvinyl alcohol, the reduction of copper- and zinc ions on the mercury electrode proceeds irreversibly. The reduction of cadmium is not so much influenced by polyvinyl alcohol. There are 3 figures, 1 table, and 5 references: 2 Soviet and 2 US.

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Card 3/3

ROYZENBLAT, Ye.M.; BRAYNINA, Kh.Z.

Determination of microquantities of zinc by amalgam polarography.
Zav.lab. 27 no.10:1197-1199 '61. (MIRA 14:10)

1. Stalinskiy filial Vsesoyuznogo nauchno-issledovatel'skogo
instituta khimicheskikh reaktivov.
(Zinc--Analysis)

STROMBERG, A.G.; BRAYNINA, Kh.Z.

Theory of the current decay at the zero charge potential. Zhur.
fiz.khim. 35 no.9:2016-2024 '61. (MIRA 14:10)

1. Tomskiy politekhnicheskii institut i Ural'skiy gosudarstvennyy
universitet.

(Polarography)

BRAYNINA, Kh. Z.; ROYZENBLAT, Ye. M.

Determination of microquantities of chlorine ions on a stationary mercury electrode. Zav.lab. 28 no.1:21-23 '62.

(MIRA 15:2)

1. Donetskii filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh reaktivov i osobo chistykh khimicheskikh veshchestv.
(Chlorine Analysis) (Electrodes, Mercury)

BRAYNINA, Kh.Z.; RYGAYLO, T.A.; BELYAVSKAYA, V.B.

Polarographic determination of trace quantities of silver in lead salts and thiourea. Zav.lab. 29 no.4:393-395 '63. (MIRA 16:5)

1. Donetskij filial Vsesoyuznogo nauchno-issledovatel'skogo instituta khimicheskikh reaktivov.
(Silver--Analysis) (Lead salts) (Urea)

BRAYNINA, Kh.Z.; KIVA, N.K.

Use of graphite electrodes in oscillographic polarography for the determination of microquantities of substances. Zav,lab. 29
no.5:526-528 '63. (MIRA 16:5)

1. Donetskiiy filial Vsesoyuznogo nauchno-issledovatel'skogo
instituta khimicheskikh reaktivov.
(Polarography) (Electrodes, Carbon)

BRAYNINA, Kh.Z.; ROYZENBLAT, Ye.M.; BELYAVSKAYA, V.B.

Determination of microamounts of substances by their accumulation as insoluble films on electrodes and subsequent electrochemical dissolution. Zav. lab. 28 no.9:1047-1052 '62.

(MIRA 16:6)

1. Donetskij filial Vsesoyuznogo nauchno-issledovatel'skogo instituta Khimicheskikh reaktivov.

(Electrochemical analysis)

BRAYNINA, Kh.Z.; ROYZENBLAT, Ye.M.

Concentration of substances in polarographic analysis. Report
No.2; Separation of iron. Zhur. anal. khim. 18 no.11:1362-
1366 N '63. (MIRA 17:1)

1. Donetskij filial Vsesoyuznogo nauchno-issledovatel'skogo
instituta khimicheskikh reaktivov i osobo chistykh khimicheskikh
veshchestv.

ROYZENBLAT, Ye.M.; BRAYNINA, Kh.Z.

Determination of zinc, lead, and copper in barium, strontium,
and calcium carbonates. Metod. anal. khim. reak. i prepar. no.
5/6:105-110 '63. (MIRA 17:9)

1. Vsesoyuzhnyy nauchno-issledovatel'skiy institut khimicheskikh
reaktivov i esbo chistykh khimicheskikh veshchestv, Donetskiiy
filial.

BOYZENBLAT, Ye.M.; POMICHEVA, T.I.; BRAYNINA, IR.L.

Determination of the microquantities of ^{90}Sr ions. Metod. anal.
khim. reak. i prepar. no.5/6:110-116 '63.

(MIRA 17:9)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut Khimicheskikh reaktivov osobo chistykh khimicheskikh veshchestv.